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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/074,018	02/14/2002	Masatoshi Shiiki	NIT-323	5629

7590 03/01/2005

MATTINGLY, STANGER & MALUR, P.C.
ATTORNEYS AT LAW
SUITE 370
1800 DIAGONAL ROAD
ALEXANDRIA, VA 22314

EXAMINER

THOMPSON, CAMIE S

ART UNIT	PAPER NUMBER
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1774

DATE MAILED: 03/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/074,018

Applicant(s)

SHIIKI ET AL.

Examiner

Camie S Thompson

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 December 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 8-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 8,9,11,12 and 14 is/are rejected.
- 7) ☒ Claim(s) 10 and 13 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Applicant's amendment and accompanying remarks filed December 15, 2004 have been acknowledged.
2. Examiner acknowledges cancelled claims 1-7.
3. Examiner acknowledges newly added claims 8-14.
4. The objections to claims 1, 4, 5 and 7 are moot due to applicant's cancellation of claims 1-7.
5. The rejection of claims 1-7 under 35 U.S.C. 112, first paragraph is moot due to applicant's cancellation of claims 1-7.
6. The rejection of claims 1-7 under 35 U.S.C. 112, second paragraph is moot due to applicant's cancellation of claims 1-7.

Claim Objections

7. Claims 8, 11, 12 and 14 are objected to because of the following informalities:

In claim 8, line 17, "in" should be deleted so that the phrase "are in each in" reads –are each in--.

In claim 11, line 22, "in" should be deleted so that the phrase "are in each in" reads –are each in-.

In claim 12, line 16, "in" should be deleted so that the phrase "are in each in" reads –are each in-.

In claim 12, line 13 the extra "(“ before L in the formula should be delete.

In claim 14, line 10 should be deleted as it is a duplicate of line 9.

In claim 14, line 23, "in" should be deleted so that the phrase "are in each in" reads –are each in-.

Claim Rejections - 35 USC § 112

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

9. Claims 12 and 14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 12 and 14 recite, "M is a K element". It is unclear as to what a "K element" is or what it is referring. It is unclear if M requires potassium or are other elements within the scope of a "K element".

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 8-9, 11-12 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hohn et al., U.S. Patent Number 6,252,254 in view of Duggal et al., U.S. Patent Number 6,515,314 and in further view of Gray et al., U.S. 5,985,173.

Hohn discloses an electroluminescent component that has a body that emits ultraviolet or blue light wherein the body comprises an inorganic luminous substance such as garnets doped with rare earths (i.e. $\text{Y}(\text{Al,Ga})_3\text{O}_{12}:\text{Ce}^{+3}$). See abstract and column 4, lines 22-68). Hohn discloses

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that the inorganic luminous substance has an index of refraction at 1.84, which results in scattering affects that lead to good mixing of blue diode emissions (see column 3, lines 41-46). The reference also discloses that a plurality of luminous substance particles that emit different wavelengths, which can result in white light emission (see column 4, lines 42-68 and column 6, lines 34-68). Hohn does not disclose the instant phosphor composition formula. Duggal discloses a light source with an inorganic phosphor that absorbs electromagnetic radiation emitted by an organic EL material in the UV to blue spectral region. The Duggal reference discloses a suitable phosphor as cerium-doped yttrium aluminum oxide (YAG) such as $(Y_{1-x-y}Gd_xCe_y)(Al_5Ga_z)O_{12}$ where $0 \leq x \leq 1$, $0 \leq y \leq 1$, $0 \leq z \leq 5$ as per the instant claims (see column 6, lines 9-31). It would have been obvious to one of ordinary skill in the art to use the phosphor presented in the Duggal reference because the material exhibits absorption of light in the wavelength range of 390 nm to about 530 nm in order to provide blue light emission. The reference does not disclose using a monovalent metal element as a dopant. The Gray reference teaches a phosphor that has an yttrium aluminum oxide (YAG) host and monovalent metal element such as copper as the dopant (see column 6, lines 10-29). The monovalent metal element provides a radiative transition of localized higher energy to lower level energy in order to populate the upper level of the host material in order to achieve green and blue emission as shown by the Gray reference in column 5, lines 19-36. None of the references disclose the content of d. This is an optimizable feature. The amount of dopant affects EM radiation. Discovery of optimum values of a result effective variable involves only routine skill in the art in re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). Therefore, it would have been obvious to one of ordinary skill in the art to have a d value in the range of $0 < d \leq 1000$ wt-ppm in

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order to achieve greater luminescence efficiency. It is well known in the art to use a light-emitting device as a backlight for a liquid crystal display.

Claims 10 and 13 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The prior art does not provide for the recited light source, further including a GdAlO_3 diffraction line in an orientation of (211) of phosphor expressed by the composition formula has intensity of 1/5 or less for a diffraction line in an orientation of (420) of the phosphor having the composition in the measurement of X-ray diffraction intensity using $\text{K}\alpha$ characteristic X-rays using Cu for material.

Response to Arguments


12. Applicant's arguments with respect to claims 1-7 have been considered but are moot in view applicant's cancellation of claims 1-7. Newly added claim 8 has the same scope as original claim 2. Applicant argues that the Hohn and Duggal references do not disclose an element M that is a monovalent ionic metal. Hohn and Duggal both disclose the use of an inorganic phosphor in an electroluminescent component. A light-emitting device can be used as a backlight for a liquid crystal display. The Gray reference was brought in to demonstrate that an inorganic phosphor can have a monovalent metal element such as copper as the dopant. The use of a monovalent metal element such as copper provides localized higher energy to lower level energy in order to populate the upper level of the host material so as to achieve blue and green

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light emission. Therefore, the combination of the Hohn, Duggal and Gray references is not without motivation.

Any inquiry concerning this communication or earlier communication from the examiner should be directed to Camie S. Thompson whose telephone number is (571) 272-1530. The examiner can normally be reached on Monday through Friday from 7:30 am to 4:00 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rena L Dye, can be reached at (571) 272-3186. The fax phone number for the Group is (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


RENA DYE
SUPERVISORY PATENT EXAMINER 2/26/07
AU.1774